

ARLINGTON HIGH SCHOOL
BOILER REPLACEMENT
ARLINGTON, MA



Project No. 13-36

ARLINGTON HIGH SCHOOL
BOILER REPLACEMENT
ARLINGTON, MA

ADDENDUM NO. 1

October 18, 2013

The original Specifications and Drawings dated October 16, 2013 for the above-captioned project are amended as stated in this Addendum. Receipt of this Addendum shall be acknowledged by inserting its number in the space provided on the Bid Form. This Addendum consists of 1 page, plus the following attachment:

1. Asbestos Abatement Specification, prepared by EnviroSafe Engineering (21 pages).

AMENDMENT TO PROJECT MANUAL

ADD 1-01 TABLE OF CONTENTS

Page TOC-1, REVISE the line "DIVISIONS 2 - 6" to read:
"DIVISION 2 – EXISTING CONSTRUCTION
Section 02080 – Asbestos Abatement

DIVISIONS 3 – 6".

ADD 1-02 SECTION 01010 – SUMMARY OF WORK

Page 01010 – 1, Article 1.01, Paragraph B, Subparagraph 1, REVISE Item a to read:

"a. The work shall include asbestos abatement associated to boiler demolition as well as any asbestos abatement incidental to the performance of the work of this Contract."

ADD 1-03 SECTION 01055 – SELECTIVE DEMOLITION

Page 01055 – 3, Article 3.03, Paragraph A, INSERT the following at the end of Subparagraph 2:

"...Asbestos abatement shall be performed as specified in Division 2 Section - Asbestos Abatement."

ADD 1-04 ANNOTATED EXISTING CONDITION PHOTOGRAPHS

REVISE note to Picture No. 5 to read:

"5. Existing ACM insulation on Boiler #2, associated piping and ductwork, as well as ACM within boiler sections and other ACM incidental to the work of this contract shall be abated by Contractor as specified in Division 2 Section – Asbestos Abatement."

END OF ADDENDUM NO. 1

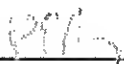
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Asbestos Abatement Specification

for

Arlington High School
869 Massachusetts Avenue
Arlington, MA

Prepared by:


Patricia E. Riley, Massachusetts Asbestos Project Designer AD #60294

prepared by:

EnviroSafe Engineering
203 Prospect Street
Brockton, MA 02301

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SECTION 02080
ASBESTOS ABATEMENT

PART 1 - GENERAL WORK REQUIREMENTS

1.01 GENERAL PROVISIONS

- A. The General Provisions of the contract, including General and Supplementary Conditions and applicable provisions of Division 1 - General Requirements, apply to the work specified within this Section.
- B. Examine all conditions as they exist at the project prior to submitting a bid for the work of this Section.
- C. All provisions of this Section relating to the health and safety of workers and the general public, as well as protection of the environment are minimum standards. The General Contractor and the asbestos abatement SubContractor are responsible for determining whether any additional and/or more stringent protective measures are required by any legal requirements or prudent conservative work practices, and implementing such measures if deemed necessary. Nothing in this Section shall be deemed to relieve the General Contractor and the asbestos abatement SubContractor from any liability with respect to any such legal requirements or requirement of prudent conservative practice.
- D. Should renovation/demolition activities, as performed by the General Contractor or affiliated Sub-Contractors, uncover any hidden materials, the material should be assumed to be asbestos-containing until classified otherwise. Removal should be performed by a Licensed Massachusetts Asbestos Abatement Contractor. The abatement Contractor must comply with all requirements outlined in the MA DOS 453 CMR 6.00; U.S. EPA NESHAP 40 CFR 61; and OSHA 29 CFR 1926.1101, including all applicable local ordinances.
- E. All work under this Section shall be performed by a Contractor holding a current Massachusetts Asbestos Abatement Contractor's License. Contractor shall furnish all labor, worker training, materials, equipment, and services for the complete and proper removal and disposal of asbestos-containing materials, as noted in Section 1.03 of this Specification.
- F. The Owner has retained Enviro-Safe Engineering, 203 Prospect Street, Brockton, MA, (617)623-6678 as the Environmental Consultant for the purpose of Project Management and Project Oversight during the entire Asbestos Abatement Project. The Contractor is responsible for providing any required project monitoring, including final visual inspection and clearance air sampling. **Because this is an AHERA project, any required project monitoring must be billed to the general contractor and not the asbestos abatement contractor.**

1.02 SCOPE OF WORK - GENERAL

- A. The following is the Scope of Work, at a minimum, required to be performed under the total base bid.

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1. Removal and disposal of all specified asbestos-containing materials (ACM) and specified non-ACM materials. This shall include identified asbestos-containing material on the interior and exterior on boiler #2 in the boiler room of Building F and dismantling of the boiler.
2. Work area preparations, including pre-cleaning of the floors, installation of critical barriers and polyethylene sheeting, construction of decontamination facilities, sealing, isolation, and other activities as required by regulations, this specification and as directed by the Owner or Consultant.
3. Protection of non-ACM materials, equipment inside of each designated work areas with two layers of polyethylene sheeting.
4. Decontamination and clean up following removal activities in each designated work area.
5. Performance of any other work or activities required by this Specification, applicable regulations, or as necessary to perform a complete job to the satisfaction of the Owner and Consultant.
6. Compliance with all applicable federal, state, and local regulations, as well as all requirements set forth in these Specifications and facility requirements.

1.03 SCOPE OF WORK - DETAILED

The scope of work includes removal of all asbestos containing materials on the interior and exterior of boiler #2 in the Building F boiler room and dismantling of boiler #2 in the Building F boiler room. Each boiler is approximately 10' x 12' x 8' in size. All work must be completed between the hours of 8:00am and 4:00pm, including a final visual inspection and final air clearance. Listed below are the quantities to be removed in each area.

Area	Materials to be Removed	Estimated Quantity
Building F Boiler Room	Exterior insulation, boiler gaskets, rope, & chamber, dismantle boiler	1 boilers, approximately 10' x 12' x 8'

1.04 SEQUENCE OF WORK

- A. The following is a typical sequence of work that Contractor shall adhere to during the asbestos abatement project. Consultant may authorize deviations from this typical sequence based upon the specific conditions encountered during the project.
1. Fuel, Electricity and Plumbing to be cut/capped and make safe by Other Trades and Sections within the Specification.
 2. Contractor shall post all required signage.

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3. Contractor shall secure area from unauthorized access.
4. Owner/Contractor will pre-clean and remove all movable objects from the immediate work area.
5. Contractor shall construct a remote decontamination unit(s), and any other construction needed to complete the work area to the satisfaction of Consultant.
6. Contractor shall prepare all work area(s) for full containment/total isolation method.
7. Contractor shall remove and dispose of all asbestos-containing materials under the total isolation method as required by these Specifications and Phasing. Care should be taken not to damage any existing utilities, plumbing or wiring which is slated to remain or to be salvaged.
8. Contractor shall decontaminate, wet wipe and HEPA vacuum the entire work area upon completion of removal.
9. Consultant shall perform a final visual inspection to assure that no visible debris exists in the work area. Contractor shall re-clean the work areas as needed until they pass a visual inspection by Consultant.
10. Contractor shall encapsulate all surfaces in the work area.
11. Consultant will perform a final air clearance as required by regulations and this specification.
12. Contractor shall remove all work area barriers, equipment, polyethylene sheeting, etc. and clean any areas to the satisfaction of Consultant and Owner.
13. Contractor shall submit all materials as required at the post abatement removal meeting not more than thirty days after completion of asbestos removal work.

1.05 RELATED WORK SPECIFIED ELSEWHERE

- A. Related work specified elsewhere: Examine all other Sections of the Specifications for requirements of related sections affecting the work of this Section, including but not limited to:
 1. 01000 GENERAL CONDITIONS
 2. 01040 PROJECT COORDINATION
- B. The work of this section shall be performed as stated herein. In performing the work of this Section, the Contractor shall refer to other Divisions for additional procedures. The Contractor is responsible for the coordination of the work of this section with other related work.
- C. Portions of the work herein require direct coordination with the work of the above noted Related Sections. The General Contractor shall coordinate this with the work of other trades, sub-Contractors and filed sub-Contractors on the site.

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1.06 ESTIMATES

- A. Section 1.03 represents a brief description of the estimated quantities of asbestos and asbestos-containing materials to be removed. This data is provided for informational purposes only, and is based on the best information available at the time of specification preparation. Nothing in this section may be interpreted as limiting the scope of work otherwise required by this contract and related documents.
- B. The quantities and location of ACM identified in Section 1.03, and the extent of work included in this section, are only best estimates which are limited by the physical constraints imposed by occupancy of the buildings. Accordingly, minor variations of plus or minus 10% of the estimated quantities of ACM are considered as having no impact on the price of this contract. Where additional asbestos abatement work is required beyond the above variations, the contract price will be adjusted according to the unit price schedule as set forth in this Specification.

1.07 COORDINATION AND PHASING OF WORK

- A. Contractor shall coordinate all work in this Section with all other work of this Project. Where additional regulatory requirements apply to the work in this Section, the Contractor shall ensure compliance with all requirements.
- B. Contractors work schedule must be coordinated with and acceptable to the General Contractor and approved by the Owner. Contractor shall work continuously and diligently in each work area on the days and during the hours indicated on their work schedule.
- C. Contractor shall cooperate fully with other Contractors at the facility.
- D. Contractor shall re-mobilize where necessary to accomplish asbestos abatement in accordance with the project phasing, as determined by the General Contractor, and as specified by the Owner.

1.08 SUBMITTALS

A. Pre-Construction Meeting

The Contractor shall meet with the Owner and the Consultant for a Pre-Construction meeting prior to commencing work on the project. The meeting shall be at the facility or at the offices of the Owner, at a mutually convenient time and date. At the meeting, the Contractor shall be represented by authorized representatives and the field supervisor who shall run the project on a daily basis, and who shall present evidence that all requirements for initiation of the work have been met. The minimum agenda for the meeting shall be:

- 1. Review of "Pre-Job Submittals".
- 2. Channels of communication.
- 3. Construction schedule, including sequence of critical work.
- 4. Designation of responsible personnel.
- 5. Procedures for safety, security, quality control, housekeeping, and related matters.
- 6. Use of premises, facilities, and utilities.

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B. Pre-Job Submittals

The Contractor shall provide one copy of the following Pre-Job Submittals at the Pre-construction Conference:

1. Copies of all notifications, permits, applications, personal licenses and like documents required by Federal, State, or local regulations obtained or submitted in proper fashion,
2. List of employees to be used on this project.
3. Copies of current Massachusetts State Asbestos License and copies of medical records as required by OSHA or a notarized statement by examining medical doctor that such examinations took place and when for each employee to be used on project,
4. Record of successful respiratory fit test performed by a Competent person (as defined by OSHA) within the previous 12 months, as required elsewhere in the documents for each employee to be used on this project,
5. Certificate of Insurance,
6. Written description of all procedures, methods, or equipment to be utilized by the Contractor that differ from the Contract Specifications, including manufacturers specifications on any equipment not specified for use by the Contract Specifications,
7. Chain of Command of responsibility at work site including supervisors, foreman, and competent person, their names, resumes and certificates of training,
8. Proposed Emergency plan and route of egress from work areas in case of fire or injury, including the name and phone number of nearest medical assistance center,
9. Name of company to be used to perform asbestos project monitoring functions and of laboratory that will analyze TEM clearance air samples, copy of MA DOS laboratory license, certificate of insurance, and proof of AIHA PAT proficiency. **To meet the requirements of AHERA, this shall be provided by the general contractor.**
10. Name of project monitor who will perform project monitoring functions, copy of current Massachusetts State Asbestos License, copy of medical records as required by OSHA or a notarized statement by examining medical doctor that such examinations took place, and record of successful respiratory fit test performed by a Competent person (as defined by OSHA) within the previous 12 months. **To meet the requirements of AHERA, this shall be provided by the general contractor.**

C. Post-Construction Submittals

The Contractor shall submit the following to the Consultant within thirty (30) days after completion of the project:

1. Manifests and waste receipts acknowledging disposal of all waste material from the project showing delivery date, quantity, and appropriate signature of landfill's authorized representative,

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2. A copy of the entry-exit logbook required elsewhere in these specifications,
3. All personnel monitoring results as required by OSHA and elsewhere in these specifications,
4. Copy of licenses, medical, and fit tests of all workers and supervisors who performed work on the project,
5. All notifications as required elsewhere in these specifications.
6. Copies of all reports submitted by the project monitor, including results of final visual inspections and clearance air sampling. **To meet the requirements of AHERA, this shall be provided by the general contractor.**

1.09 REFERENCE STANDARDS, REGULATIONS AND CODES

- A. All work shall be performed strictly according to the Specifications contained herein and with the regulations cited in this Article. The Contractor undertaking asbestos abatement work and persons in their employ shall comply with and be bound to requirements of the following Federal, State, and Local standards, regulations and codes. These standards and codes shall be by reference made part of this Section and shall be complied with. Whenever regulations are conflicting, the more stringent regulation will prevail.
1. US Department of Labor; Occupational Safety and Health Act of 1970. (Particular attention is drawn to the Asbestos Regulations: CFR Title 29, Part 1910, Sec. 1910.1001 and Part 1926, Sec. 1926.1101, and the Respirator Regulations; CFR Title 29, Part 1910, Sec. 1910.134 and the Hazard Communication Program, CFR Title 29, Part 1910.1200).
 2. US Environmental Protection Agency, CFR, Title 40, Part 61, Subparts A and M, National Emission Standards for Hazardous Air Pollutants; Asbestos NESHAP Revision; Final Rule, Dated Tuesday, November 20, 1990.
 3. US Environmental Protection Agency; TSCA Title II, Asbestos Hazard and Emergency Response Act (AHERA), 40 CFR Part 763 Subpart E - "Asbestos-Containing Materials in Schools" and also 40 CFR, Part 763, Subpart G - "Worker Protection Rule".
 4. US Department of Transportation regulations, 49 CFR Parts 172 and 173.
 5. All Commonwealth of Massachusetts laws, regulations and standards, including the regulations 453 CMR 6.00 "The Removal, Containment or Encapsulation of Asbestos" and 310 CMR 7.15 "Asbestos", 18.00 and 19.00 and MGL Chapter 21E.
 6. Other Federal, State and local statutes, ordinances, regulations, or rules pertaining to this Section and the work described herein, including the storage, transportation and disposal of asbestos.
- B. All regulations by these and other governing agencies in their most recent version are applicable. These specifications refer to many requirements found in these references, but in no way intend to cite or reiterate all provisions therein or elsewhere. It is the Contractor's responsibility to know, understand, and abide by all such regulations and common practices. Other provisions contained in

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these references may from time to time during the execution of this contract be enforced by the Owner at his own discretion.

1.10 REGULATORY SUBMITTALS

- A. The Contractor shall be responsible for securing all necessary permits for asbestos related work, including hauling, removal, and disposal, fire, and materials usage, or any other permits required to perform the specified work.
- B. The Contractor shall notify the following agencies in appropriate manner and place of impending work, and shall provide evidence of notifications at the pre-construction conference:
 - 1. U.S. Environmental Protection Agency,
J. F. Kennedy Federal Building
Boston, Massachusetts 02203
(10 working days in advance)
 - 2. Massachusetts Department of Environmental Protection
Division of Air and Hazardous Materials
(10 working days in advance)
 - 3. Massachusetts Department of Occupational Safety
Asbestos Control Unit
(10 working days in advance)
 - 4. Town of Arlington Fire Department and other state or city agencies as required by law or ordinance.

1.11 PROJECT CONDITIONS

- A. Take all measures and provide all material necessary for protecting fixed machinery, controls, instrumentation, equipment, and furniture from asbestos fiber, dust and debris and from water damage.
- B. Working space and space available for storing materials is restricted within the confines of the project and/or at locations to be designated by the Owner.
- C. Provide access and personal protective equipment (disposable suits) to the Consultants and Visitors, who are licensed and certified, to visit the Work Areas to maintain and adjust building services.
- D. Schedule the use of existing utilities with the Owner. No utility service, fire protection system, or communication system may be interrupted without prior approval of the Owner.
- E. Water, electric power, lighting and other utilities, toilets, and other facilities shall be provided by the Owner from existing sources where Contractor's use is not excessive and does not interfere with buildings normal use. Where existing utilities of the facility are not adequate or cannot be used, the Contractor is responsible for providing alternative sources, the cost of which is to be included in bid price. The use of the Facility's utilities shall be coordinated through the Owner.
- F. Post and affix caution signs and labels as required by OSHA regulation, 29.CFR.1926.1101 (k) (1). Post safety signs outside the work project as may be required by the Owner. Obtain two copies of

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29.CFR.1910.1001, 29.CFR.1926.1101, 40.CFR.61, Subpart M, and Commonwealth of Massachusetts Regulations 453 CMR 6.00 and 310 CMR 7.00, and post one copy at the job site and retain one copy on file.

- G. Post at the job site, or at the entrance to each independent Work Area, one copy of all Material Safety Data Sheets (MSDS's) of all chemicals and other substances to be used on this contract. These sheets shall be made available to the Consultants for review.

1.12 GENERAL REQUIREMENTS

- A. All work-site preparations and practices will be conducted in accordance with all Federal, Massachusetts and appropriate City and other local regulations, standards and codes pertaining to worker health protection, protection of the public health and the environment, including current US Environmental Protection Agency (EPA), Department of Labor Occupational Safety and Health Administration (OSHA), US Department of Transportation (DOT), Massachusetts Department of Occupational Safety (MA DOS), Massachusetts Department of Environmental Protection (DEP), local and all other Federal, Commonwealth of Massachusetts and local regulations pertaining to asbestos removal, its transportation and disposal.
- B. All operations involving exposure to airborne asbestos fibers shall be carried out according to the requirements of Part 3.
- C. The Consultant will render certain technical services during the Work, including without limitation, the services described at 453 CMR. 6.07 (5) and described within this Section. All services performed by such Representative shall be considered advisory to, and for the sole and exclusive benefit of the Owner. The Asbestos Abatement Contractor acknowledges that the Consultant is an independent Contractor of the Owner and agrees that no act or omission by such Consultant, and no communication by said "Consultant", shall be deemed in any manner to alter or modify the terms of this Contract, or to waive any provision hereof, or to bind Owner, unless specifically agreed upon by Owner in a signed written instrument.
- D. Prior to use of any design, device, material, method of operation, or process covered by letters patent or copyright, the right for such use shall be secured by suitable legal agreement with the patentee or owner of the letters patent or copyright. No arrangement involving letters patent or copyright is acceptable, if subsequent payment for permanent use following completion of the work is required or implied. The Contractor shall be responsible for any liability on the part of the Consultant that may result from violations by the Contractor.

1.13 SPECIAL CONSIDERATIONS

- A. Storage
1. Limited storage space may be provided by the Owner inside the facility. Contractor will supply any additional temporary storage as needed. All materials and equipment are to be kept in orderly fashion in designated areas, free and clear of halls and doorways, and in conformance with all regulations, codes, and in consideration of building usage. Contractor will be allowed to store waste in a waste dumpster on-site, to be coordinated with the Owner.

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B. Working Hours

1. Working hours for the project will be between the hours of 8:00am and 4:00pm.

End of Part 1

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PART 2 - PRODUCTS

2.01 SHEET PLASTIC

- A. Polyethylene Sheet: Provide flame-resistant polyethylene film that conforms to requirements set forth by the National Fire Protection Association Standard 701, Small Scale Fire Test for Flame-Resistant Textiles and Films. Provide largest size possible to minimize seams, 6.0 mil thick, frosted or black as indicated.

2.02 MISCELLANEOUS MATERIALS

- A. Duct Tape: Provide duct tape in 2" or 3" widths as indicated, with an adhesive that is formulated to stick aggressively to sheet polyethylene.
- B. Spray Glue: Provide spray adhesive in aerosol cans which is specifically formulated to stick tenaciously to sheet polyethylene.
- C. Wetting Materials: For wetting prior to disturbance of Asbestos-Containing Materials use either amended water or a removal encapsulant:
1. Amended Water: Provide water to which a surfactant has been added. Use a mixture of surfactant and water which results in wetting of the Asbestos-Containing Material and retardation of fiber release during disturbance of the material equal to or greater than that provided by the use of one ounce of a surfactant consisting of 50% polyoxyethylene ester and 50% polyoxyethylene ether mixed with five gallons of water.
 2. Removal Encapsulant: Provide a penetrating type encapsulant designed specifically for removal of Asbestos-Containing Material. Use a material which results in wetting of the Asbestos-Containing Material and retardation of fiber release during disturbance of the material equal to or greater than that provided by water amended with a surfactant consisting of one ounce of a mixture of 50% polyoxyethylene ester and 50% polyoxyethylene ether in five gallons of water.
- D. Disposal Bags: Provide 6 mil thick leak-tight polyethylene bags labeled as required by Article 3.07 of this Section.
- E. Encapsulants shall conform to USEPA requirements, shall contain no toxic or hazardous substances and no solvent.
- F. Encasement shall consist of primary cellular polymer coat, polymer finish coat, and any other finish coat as approved by the CO
- 2.03 PROTECTIVE CLOTHING:**
- A. Coveralls: Provide disposable full-body coveralls and disposable head covers (Tyvek or approved equal), and require that workers in the Work Area wear them. Provide a sufficient number for required changes, for workers in the Work Area.
- B. Boots: Provide work boots with non-skid soles, and where required by OSHA, foot protection, for workers. Provide boots at no cost to workers. Do not allow boots to be removed from the

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Work Area for any reason, after being contaminated with asbestos-containing material. Dispose of boots as asbestos-contaminated waste at the end of the work.

- C. Hard Hats: Provide head protection (hard hats) as required by OSHA for workers, and provide 1 spares for use by Contractor and the Contracting Officer, Project Administrator, and Owner. Require hard hats to be worn at all times that work is in progress that may potentially cause head injury. Provide hard hats of type with plastic strap type suspension. Thoroughly clean, decontaminate hats before removing them from Work Area at the end of the work.
- D. Goggles: Provide eye protection (goggles) as required by OSHA for workers involved in scraping, spraying, or any other activity which may potentially cause eye injury. Thoroughly clean, decontaminate and bag goggles before removing them from Work Area at the end of the work.
- E. Gloves: Provide work gloves to workers and require that they be worn at all times in the Work Area. Do not remove gloves from Work Area and dispose of as asbestos-contaminated waste at the end of the work.

2.04 RESPIRATORS

- A. Respirators shall be selected from those jointly approved by the National Institute for Occupational Safety and Health (NIOSH), US Department of Health and Human Services and the Mine Safety and Health Administration (MSHA), US Department of Labor.

End of Part 2

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PART 3 - EXECUTION

3.01 GENERAL CONSIDERATIONS

A. Approvals and Inspection

1. All temporary facilities, work procedures, equipment, materials, services, and agreements must strictly adhere to and meet these contract specifications along with EPA, OSHA, NIOSH, regulations and recommendations as well as any other federal, state, and local regulations. Where an overlap of these regulations exists, the most stringent one applies. All work performed by the Contractor is further subject to approval of the Owner.
2. Modifications to these isolation and sealing methods, procedures, and design may be considered if all elements of proper and safe procedures to prevent contamination and exposure can be demonstrated. Written modifications to these specifications must be made to the Owner for review before they can be used for work on this project.

B. HVAC Systems

1. All duct work, heating units and HVAC equipment shall be wrapped in two layers of six-mil polyethylene prior to any other work taking place, or excluded from work area boundaries by airtight polyethylene sheeting.

C. Barriers and Isolation Areas

1. The Contractor shall construct and maintain suitable critical barriers within the building to separate work areas from spaces occupied by the Owner. Critical barriers shall be of sufficient size and strength to prevent staff, residents, the public and others from entering the work areas. Critical barriers shall be constructed at all hallways, doorways, grille openings, or other open entrances to the work area. These barriers shall be removed by the Contractor at the completion of construction work.
2. Warning signs shall be posted on all critical barriers at the commencement of the work area preparation, as required in 1926.1101 of the Occupational Safety and Health Standards Federal Register, Volume 59, Number 153, August 10, 1994. The signs shall display the proper legend in the lower panel, with letter sizes and styles of a visibility at least equal to that specified in OSHA Standard 1926.1101 (k)(6)(ii). The signs will read as follows:

**DANGER
ASBESTOS
CANCER AND LUNG DISEASE HAZARD
AUTHORIZED PERSONNEL ONLY
RESPIRATORS AND PROTECTIVE CLOTHING
ARE REQUIRED IN THIS AREA**

3. The signs shall be posted at the perimeters of asbestos removal, demolition or construction areas where the asbestos-containing material to be removed exists.
4. The Contractor shall maintain all temporary and critical barriers, facilities and controls as long as needed for the safe and proper completion of the work. Any breaches in the containment will be corrected at the beginning of each shift and as necessary during the

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workday. Work will not be allowed to commence until all control systems are in place and operable.

5. No barriers shall be removed until the work areas are thoroughly cleaned and all debris has been properly bagged and removed from work areas, and the air has passed final clearance tests, in accordance with provisions detailed herein.

3.02 ACM LOCATION PREPARATION AND REMOVAL

A. Preparation

1. Primary Barriers

Prior to construction of the asbestos removal area, all primary barriers shall be sealed with a minimum of one layer of six-mil plastic sheeting and duct tape. Primary barriers consist of all windows, vents, closed and locked doors and openings to adjacent spaces from the work area. HVAC systems shall be sealed, where applicable, as described previously with two layers of 6-mil polyethylene sheeting.

2. Critical Barriers and Total Isolation

- a. Critical barriers consist of the boundaries of the work area including floors, walls, ceilings and any constructed barrier to restrict public access to the work area. Floors shall be sealed with a minimum of two layers of six-mil polyethylene sheeting. There shall be a minimum overlap of two feet (24") at the floor seams and the sheeting will run a minimum of two feet (24") up the walls.
- b. The containment walls shall be constructed using a minimum of two layers of six-mil polyethylene sheeting after sealing the floors. This shall be done using a minimum of one layer of six-mil polyethylene sheeting. Overlaps between the walls and floors shall be interwoven as follows:
- c. The first floor layer shall be taped up the wall a minimum of two feet (24"). The first wall layer shall be sealed to the floor layer at the corner of the floor and wall. The second floor layer shall be sealed to the first wall layer at a minimum of a two foot (24") overlap. The second wall layer shall cover all overlaps and be sealed to the floor.
- d. The containment ceiling shall be constructed using a minimum of one layers of six-mil polyethylene sheeting after sealing the walls. The ceiling shall overlap between the first and second layers of walls at a minimum of a two foot (24") overlap.
- e. The enclosure shall be constructed so as to allow the removal of interior layers of plastic without damaging the exterior layer. The exterior layer shall stay intact for the duration of the project and be designated the critical barrier.

B. Decontamination Unit and Procedures

1. It is the Contractor's responsibility to provide decontamination chambers consisting of an Equipment Room, Shower, and Clean Room for personnel involved in asbestos removal. Each of the three rooms shall be of sufficient size to accommodate authorized personnel and related equipment. Each room shall be separate of other rooms by a double flap of 6-mil

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polyethylene sheeting acting as an airlock. This shall be designed to minimize fiber migration and airflow between the decontamination unit rooms. The rooms shall be framed with 2"x 4" lumber, masked, sealed and attached to the entry/exit ways of asbestos work areas. The three rooms together shall be referred to as the Decontamination Unit. A Decontamination Unit will be required for each separate containment area, if work is to be divided into sections.

2. The Equipment Room shall serve as a transfer room and an intermediate area between the work area and any decontamination procedures to occur in the shower room. This room shall be vacuumed and washed whenever necessary in order to prevent asbestos dust and debris accumulations or when required by Consultant. The Equipment Room will also serve as an access area to the shower for personnel leaving the work area. Workers leaving the containment shall remove and dispose of disposable protective suits and wear only respirators into the Shower. At the end of each day, bags of asbestos waste and contaminated materials shall be removed after a thorough decontamination procedure as described in the contract specifications. Workers performing this operation will wear respirators and disposable full-body protective suits.
3. The Shower Room shall have a continuous supply of cold and hot water, and be suitably arranged for complete showering during decontamination. The Shower Room with curtained doorways will comprise an airlock between contaminated and clean areas. All materials being passed from the equipment room to the clean room must pass through the shower and be thoroughly decontaminated. The shower floor will not be allowed to sit at ground level, but must be elevated a minimum of six inches off of the floor with a suitable catch basin for drainage into a filtration system. The shower will be equipped with a sump pump and an in-line two-stage filter. The first stage will efficiently filter fibers greater than twenty (20) microns in length and the second stage will filter bulk material and fibers greater than five (5) microns in length. Alternatively, shower water may be re-routed back into the work area to be bagged and disposed of as asbestos contaminated waste. The Contractor shall provide disposable towels and soap in the shower area.
4. The Clean Room shall store asbestos worker's clean protective clothing and clean respirator equipment. Contaminated clothing, respirators, tools, equipment, or other materials shall not be allowed into the Clean Room or beyond. The Clean Room will serve as an access for personnel entering the work area, and for the donning of respiratory protection and protective clothing. The Contractor shall provide space in the clean room for the worker's personal clothing. This may be in the form of hangers or lockers.
5. The decontamination enclosure is called a "three-stage" decontamination enclosure and shall be the type constructed and used for this project in specified areas. A "two stage" unit resembles the "three-stage" unit in construction detail, but it is built without a shower section.

C. HEPA Filtration

1. Adequate negative pressure shall be provided within the enclosure as specified below.
2. After the work area is totally isolated, and prior to commencement of work, the Consultant will perform a visual inspection of the work area. This will consist of checking the integrity of barriers including smoke testing the containment if deemed necessary by Consultant. This does not in any way relieve the Contractor's responsibilities to ensure the isolation of the

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work area. The volume of air within the contained work area shall be changed a minimum of four (4) times per hour. A pressure differential reading of 0.02 inches of water shall be maintained in the negative pressure work area relative to adjacent areas. Equipment used for producing a negative pressure work area shall have a filtering device which is at least 99.97% efficient at a 0.3 micron pore size. Filters meeting these standards are referred to as High Efficiency Particulate Absolute (HEPA) filters.

3. The HEPA filtration units shall be equipped with the following:
 - a. Magnehelic gauge to monitor the unit's air pressure difference across the filters and be able to interpret magnehelic reading to cubic feet per minute (CFM).
 - b. An affixed label, clearly marked and conspicuous, showing the most recent installation date and hour reading of the primary internal HEPA filter.
 - c. A clock to record the unit's operation time.
 - d. Automatic shut off for filter failure or absence.
 - e. Audible alarm for unit shutdown.
 - f. Amber flashing warning light for filter loading.
 - g. The unit must be equipped with a safety system that prevents it from being operated with the HEPA filter in an improper orientation.
 - h. All flexible ducting, vent tubing, adapter plates and other equipment used for the passage of filtered air shall be undamaged, uncontaminated, and free of air leaks at all points.
4. Pre-filters shall be changed frequently during the removal.
5. Air movement will flow uninterrupted from outside the work area through the Decontamination Unit into the work area. There shall be no other openings for air to enter the containment unless approved by the Consultant in writing.
6. HEPA filtration units shall be placed as far as possible from the air intake to the containment to prevent short-cycling of fresh air.
7. This containment, along with the decontamination chamber, shall constitute the critical containment of the work area from the surrounding areas. All openings to this critical containment are to be sealed except where air must enter the worksite due to the use of exhaust equipment. Unless approved by the Consultant, air shall enter the critical containment only through the Decontamination Unit.
8. Modifications to these isolation and sealing methods, procedures, and design may be considered if all elements of proper and safe procedures to prevent contamination and exposure can be demonstrated. Written modifications to these specifications must be made to the Owner for review before they can be used for work on this project.

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D. ACM Removal

1. Asbestos removal will not begin until the Consultant has given authorization to proceed. The Consultant, based on the criteria presented herein will give this authorization after the removal area has passed a visual inspection.
2. All asbestos-containing material must be soaked with amended water before removal. The material shall be sufficiently saturated to reduce fiber release so that the airborne fiber concentration does not exceed the established OSHA Permissible Exposure Limits, (PEL's). The amended water shall not be applied in amounts that will cause leakage or runoff of contaminated water from the removal area. Dry removal will not be permitted during this project.
3. Asbestos-containing material shall be carefully removed and placed immediately into bags. Bags must be filled with water to the point where all asbestos is adequately wetted as defined by Federal Regulations 40 CFR 61 Subpart M. Asbestos will not be permitted to let fall or sit on the ground before being bagged.
4. Fine cleaning of residual asbestos-containing material shall consist of carefully scraping or brushing the material from surfaces. The recommended method for brushing a substrate after gross removal has taken place is to use a nylon brush. Wetting of the substrate shall also occur while this brushing is performed, since the chance of airborne fiber generation during fine cleaning still exists.
5. Water Atomizing Devices, commonly termed "mistlers," shall be utilized by the Contractor during asbestos removal and fine cleaning phases, to provide further dust control protection in the work area. The mistlers shall be supplied with amended water and in operation continuously during these phases.
6. Asbestos waste must be double bagged before it is removed from the contained area. The inner bag will be HEPA vacuumed and showered before being placed in the outer bag. Vacuuming must take place in the Equipment Room of the Decontamination Unit. Washing must take place in the Shower Room of the Decontamination Unit. Bags will normally be removed at the end of each working day and transported from the job site.
7. Any materials considered contaminated by the Owner or the Owner's Representative that cannot be double bagged shall be wetted and containerized in disposal drums. Oversized contaminated materials shall be wrapped airtight in two layers of 6-mil polyethylene sheeting.
8. All bags, containers or wrapped materials transported out of the work area shall be labeled with preprinted labels required by Federal EPA, OSHA and the Department of Transportation regulations. Any carts used to transport asbestos waste to the on-site holding dumpster should be HEPA vacuumed and wet wiped each day, and may be inspected by the Owner or Consultant every day.
9. Carts that are not made of an impermeable material shall be lined with a minimum of one layer of 6-mil polyethylene sheeting to be removed after each shift and disposed of as contaminated waste. The transport route and the transport of waste out of the work area shall be coordinated with the on-site Owner's representative.

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10. The work area shall be cleaned of residual asbestos debris on a daily basis. The Decontamination Unit floor (top layer) shall be picked up and replaced on a daily basis, if required by Consultant.
11. Air testing may be performed continuously outside the enclosed area. If fiber concentrations exceed 0.010 fibers/cc or background levels, work shall stop and the Contractor shall perform clean up activities in the affected areas and check the integrity of the critical barriers. Clean up activities shall include but not be limited to wet wiping and vacuuming surfaces with a HEPA-equipped vacuum. Work may continue only after the source of contamination is identified, corrected and proper cleaning activities are implemented. The Consultant will perform air testing on site in the affected areas. If the results of these air tests are not below 0.010 fibers/cc, the Contractor shall perform a thorough decontamination of the affected areas.
12. After brushing and scraping, surfaces shall be free of visible debris and fibers. A final wipe-down of the substrate with wet, lint-free rags shall take place in order to ensure proper cleaning. All surfaces including floors, walls, and ceilings shall also be HEPA vacuumed clean. All visible asbestos-containing material is to be removed by the Contractor before encapsulation procedures are allowed to begin. The Project monitor will perform an inspection of the work area prior to giving approval to begin encapsulation of work area. Removal substrate must be clean and bare, and the entire work area must be free and clear of any suspect material for the Contractor to pass this visual inspection and begin encapsulation.
13. Where insulated substrates penetrate walls or other demising structures, remove asbestos through to the opposite side of the demising structure. After the removal of the asbestos materials at the demising structures, any resulting spaces or breeches shall be foamed or sealed airtight.

E. Removal of Critical Barriers

1. No critical barrier shall be taken down until the final visual inspection and final clearance air tests are found to be below 70 structures/mm² as per AHERA. Once removal has been completed, the project monitor will visually inspect the area to ensure that no visible debris has been left. At that time clearance air samples will be collected in the area. Since the total quantity of material being removed in the containment is greater than 160 square feet, five air samples will be collected in the containment and five air samples will be collected outside of the containment. In accordance with AHERA, the samples will be analyzed by TEM. The containment shall be dismantled after the air sample results confirm that the Massachusetts and AHERA clearance level of less than 70 structures/mm² have been met.
2. After a successful final visual inspection, encapsulation, and a successful final air test, Contractor shall perform post abatement takedown.
3. All encapsulated polyethylene sheeting used in the construction of the Decontamination Unit and Containment Area shall be bagged and disposed of as asbestos contaminated waste. Areas exposed during this process shall be examined for traces of suspect material. If any is

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found, it will be picked up by HEPA vacuuming and wet cleaning, and a coat of encapsulant be applied to the affected areas. Based on the amount of suspect material found, the Consultant may request the use of misters in the surrounding area. The Contractor will then implement the use of misters as a precautionary measure.

F. Encapsulation Procedures

1. The polyethylene barriers shall be cleaned of gross contamination before a lock-down sealant can be applied to the substrate. After the substrate has been cleaned and all polyethylene barriers of the work area are cleaned of all visible debris, the Contractor shall request a visual inspection of the work area by the Consultant. Prior to the inspection of the work area, the Contractor shall remove the inside layer of the work area polyethylene sheeting, after cleaning, and dispose of it as contaminated waste. The work area will still have all primary barriers intact and one layer of polyethylene sheeting over floor, walls, and permanent structures within the work area during the inspection.
2. Workers performing lock-down must wear disposable protective clothing and respirators suitable for asbestos. The encapsulation process shall not be treated any differently from the removal process in this respect.
3. The lock-down material shall be applied with a low-pressure (less than 500 p.s.i.), airless spray-type mechanism.
4. All surfaces in the work area will be encapsulated. A minimum of one coat of lock-down encapsulant will be applied to prevent the generation of airborne residual fibers. The lock-down encapsulant will be applied to both the substrate and the polyethylene sheeting serving as the containment barrier. During the encapsulation process, the Contractor shall decrease the negative pressure of the work area by shutting down some of the air filtration devices in the work area. If the lock-down material is being applied to irregular, grooved, or corrugated surfaces, it shall be administered from the opposing side or at a right angle to the direction of the previous application. The encapsulant shall be left to dry before the commencement of final air testing. After final air clearance and inspection criteria have been met, the Contractor shall begin final takedown procedures.

3.03 DISPOSAL OF ASBESTOS WASTE

- A. Waste removal procedures shall be done in accordance with all regulations as set forth by the agencies having authority to regulate.
- B. The Contractor shall provide proof that disposal sites for the waste materials have current and valid permits to dump asbestos waste at the time of the pre-construction meeting.
- C. Receipts shall be obtained by the Contractor from the dumping site(s), and submitted to the Owner upon request for final payment.
- D. Warning labels having permanent, waterproof print and adhesive shall be affixed to all bags, trucks, drums (lids and sides), and other containers used to store and/or transport asbestos-containing material. Labels must be conspicuous and legible and contain the following warning:

**CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST**

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CANCER AND LUNG DISEASE HAZARD

- E. The Contractor shall be responsible for all necessary precautions to prevent pollution by spilling during the performance of services and shall assume full responsibility for all Contractor caused spills, which shall be cleaned up at the Contractor's expense.
- F. Temporary storage of asbestos waste on-site must be approved by the Owner.

3.04 HOUSEKEEPING

- A. Throughout the work period, the Contractor shall maintain the building and site in a standard of cleanliness as specified throughout these specifications.
 - 1. Contaminated disposable clothing, respirator filters, and other debris shall be bagged and sealed at the end of each workday.
 - 2. All asbestos generated by either removal or repair shall be bagged immediately and not allowed to be left exposed at the end of each workday.
 - 3. Respirators shall be thoroughly cleaned at the end of each workday and stored for the next day's use.
 - 4. The Contractor shall retain all stored items in an orderly arrangement allowing maximum access, not impeding traffic, and providing the required protection materials.
 - 5. The Contractor shall not allow the accumulation of scrap, debris, waste material, and other items not required for completion of the work.
 - 6. The Contractor shall provide adequate storage for all items awaiting removal from the job site, observing all requirements for fire protection and protection of the ecology.
 - 7. Daily and more often if necessary, the Contractor shall inspect the work areas and adjoining spaces, and pick up all scrap, debris, and waste material. Remove all such items to the place designated for their storage.
 - 8. The Contractor shall maintain the site in a neat and orderly condition at all times.

3.05 QUALITY CONTROL

- A. The Owner will retain the services of an Owner's Representative to provide project administration, monitoring of Contractor work practices and performance, inspection of the work-sites, bulk fiber identification. Many references to Owner will in fact be managed by the Owner's Representative (Consultant) in lieu of the Owner, at the Owner's request, and the Contractor is required to regard the requests and interpretations of the Consultant as having full force unless expressly informed otherwise by the Owner. The Contractor shall supply the Project Monitor to provide all onsite air monitoring required, including the final visual inspection and air clearance.

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3.06 DAILY PERSONAL AIR SAMPLING

- A. Contractor shall provide daily personal sampling to check employee exposure levels for the purpose of establishing respiratory protection needs. Samples shall be taken for the duration of the work shift or for eight hours, whichever is less. Personal samples need not be taken every day after the first day if working conditions remain invariant, but must be taken every time there is a change in the removal operation, either in terms of the location or the type of work. Sampling will be to determine eight-hour Time-Weighted-Averages (TWA). The Contractor is responsible for personal sampling as outlined in OSHA Asbestos Standard 1926.1101.
- B. Sampling personnel shall be proficient in the collection and analysis of air samples under NIOSH Method 7400, and must be supervised by an individual who has completed the NIOSH 582 training course or equivalent.
- C. Air sampling results shall be available at the job site in written form no more than twenty-four (24) hours after the completion of a sampling cycle. The document shall list each sample's result, sampling time and date, person monitored, flow rate, sample duration, microscope field area, number of fibers per fields counted, cassette size and analysts name and company. Air sample analysis results will be reported in fibers per cubic centimeter.

END OF PART 3